

ABSTRACT

The present invention includes a system and method for confining plasma within a plasma processing chamber. The plasma processing apparatus comprises a first electrode, a power generator, a second electrode, at least one confinement ring, and a ground extension surrounding the first electrode. The first electrode is configured to receive a workpiece and has an associated first electrode area. The power generator is operatively coupled to the first electrode, and the power generator is configured to generate RF power that is communicated to the first electrode. The second electrode is disposed at a distance from the first electrode. The second electrode is configured to provide a complete electrical circuit for RF power communicated from the first electrode. Additionally, the second electrode has a second electrode area that is greater than the first electrode area. At least one confinement ring is configured to assist confine the plasma. The plasma is generated with the RF power being communicated between the first electrode and the gas residing inside the confinement rings. The ground extension drains charge from the plasma boundaries with a grounded conductive surface.